

Data sheet

Surface Treatment

- BIS UltraProtect® 1000 system
- Zinc plating (blue)
- Pre-galvanizing
- Hot dip galvanizing
- Stainless steel 316 (1.4401) and 316L (1.4404)
- Powder coating
- Delta-Tone 9000

To improve the corrosion resistance of steel products, Walraven uses all kinds of methods. Below you will find an overview:

BIS UltraProtect® 1000 system

The BIS UltraProtect® 1000 system is the ideal and most durable solution for securing or supporting mechanical installations, solar systems and many other types of installations. The products in the BIS UltraProtect® 1000 system have very high corrosion resistance and can be applied in C1-C4 environments. BIS UltraProtect® 1000 products effortlessly withstand a salt spray test of at least 1,000 hours* (in accordance with ISO 9227).

Although the system utilizes a relatively thin protective coating, the corrosion resistance is high. Not only does the BIS UltraProtect® 1000 system offer a smooth and fine finish, the products are also visually appealing. An additional benefit of the relatively thin protective coating is that threaded products are also well protected against corrosion. The BIS UltraProtect® 1000 products, including threaded items such as bolts, nuts and threaded rods, have superior corrosion resistance.**

Zinc plating (blue)

The protective coating is applied in an electrolytic process after cleaning, degreasing and pickling. The thickness of the layer of zinc is between 5 and 15 µm and is determined by the current intensity and the duration of the galvanizing process. After the galvanizing process the products are passivated to extend the protection period.

Pre-galvanizing

Pre-galvanizing is a continuous thermal galvanizing process applied before material treatment in manufacturing processes. The strip steel is guided through a bath containing liquid zinc after having been cleaned, degreased and pickled. The thickness of the layer of zinc is between 20 and 25 µm. Later the steel is cut to the required width. The sides of this cut material are not galvanized. This is also the case with any holes that may be drilled in the pre-galvanized material. The sides of material thinner than 1,5 mm are protected somewhat by the zinc layer on the top and bottom by the electrolytic process of 'pulling together'.

This surface protection is suitable for threaded products, which are to be used indoors or in a non-corrosive environment.

* Until the occurrence of maximum 5% red rust.

** The warranty conditions are applicable for C1-C4 corrosive environments according to ISO 12944-2.

See our website walraven.com for further information.

Hot dip galvanizing

The products to be treated are cleaned, degreased and pickled and subsequently put into an immersion bath of liquid zinc. The immersion bath has a temperature of 550 °C. In this process an alloy of zinc/iron develops on the surface and is then covered by a layer of pure zinc.

The thickness of the zinc layer varies between 50 and 100 µm. In consequence the process is less suitable for products with threaded holes or rods. Hot dip galvanized products are suitable for indoor as well as outdoor use and also for damp and light-corrosive environments.

The application for hot dip galvanizing processes is limited to the heavy systems.

Stainless steel 316 (1.4401) and 316L (1.4404)

Stainless steel 316 is one of the best corrosion resistant types of stainless steel. It offers a superior corrosion resistance in many corrosive environments. The protective layer is damaged by treatments such as punching, drilling and welding. That is why, after the last treatment, all stainless steel products receive an extra treatment which pickles and passivates to restore the protective layer. Products from stainless steel 316 can be applied in aggressive situations such as a sea climate and industry.

Powder coating

A protective layer of epoxy powder in any specified color is baked onto pre-treated products. The pre-treatment may differ per product and per application. In marine environment, the most durable solution is the combination of BIS UltraProtect® 1000 combined with powder coating.

The combined treatment reaches well over 1,000 hours in salt spray test without any signs of red rust.

Delta-Tone 9000

Delta-Tone 9000 consists of zinc and aluminium particles that are held together by an inorganic binder. This offers an effective protection against corrosion even with a limited thickness of the coating. Delta-Tone 9000 is applied in an immersion/centrifugal or spray process and then dried at a temperature of 200 °C. With this method an even layer is formed over the whole product with a thickness of 10 – 12 µm. Subsequently Delta-Tone 9000 forms a connection with the metal underneath.

In contrast to electrolytic and thermal galvanizing, with Delta-Tone 9000 there is no danger of hydrogen embrittlement in materials with an increased carbon content, such as spring steel. To improve the corrosion resistance, the process can be repeated which increases the thickness each time by 10 – 12 µm.

Products protected by Delta-Tone 9000 are suitable for outdoor use as well as moderate corrosive environments.

Surface treatment	Thickness protection layer (µm)	Hours until 5% red rust*
BIS UltraProtect® 1000	- **	1,000
Zinc plating (blue)	5 - 10	72
Pre-galvanizing	20 - 25	150
Hot dip galvanizing	50 - 80	300 - 600
Powder coating	100	1,000
Delta-Tone 9000	10 - 12	480

* Until the occurrence of maximum 5% red rust.

** Method and thickness protection layer differ per product.

Walraven products are not treated with surface treatments containing Chromium 6.

Salt-spray test

To compare the protection duration of various surface treatments, a salt-spray test is carried out according to ISO 9227. In this test products are placed in a closed cabinet and sprayed with a salt solution. The products will start to corrode. The point at which 'white' and then 'red' rust appears is noted down.

This test does not give a perfect protection duration (this depends on the surroundings in which the product is applied), but does offer a comparative view of the various surface treatments.